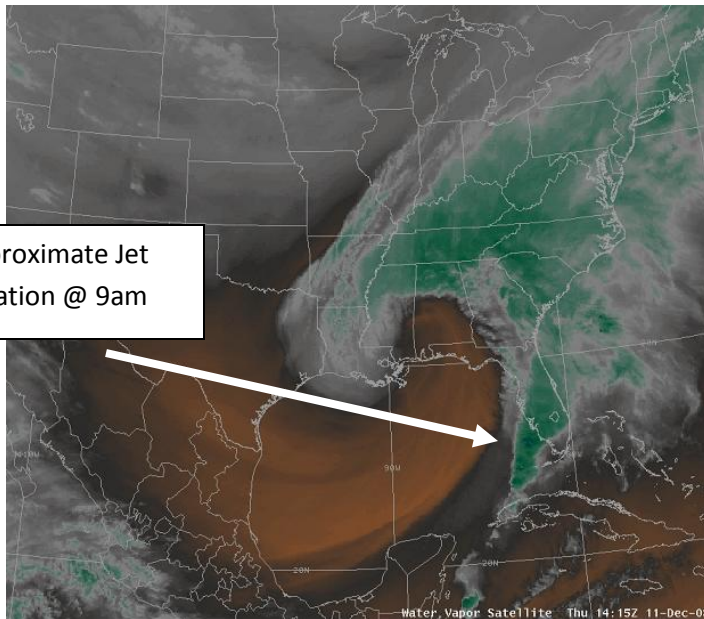
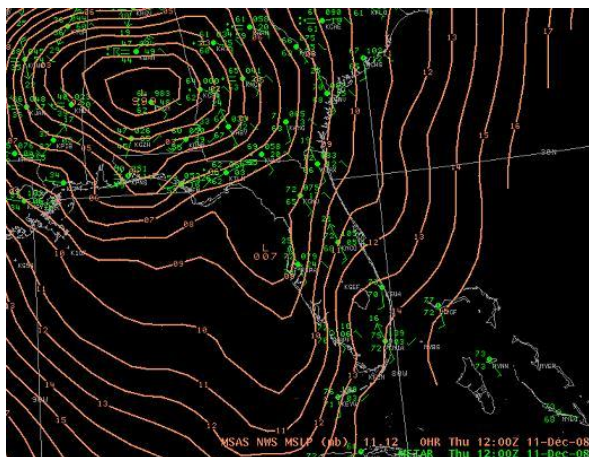


Weak Squall Line Event: December 11th, 2008

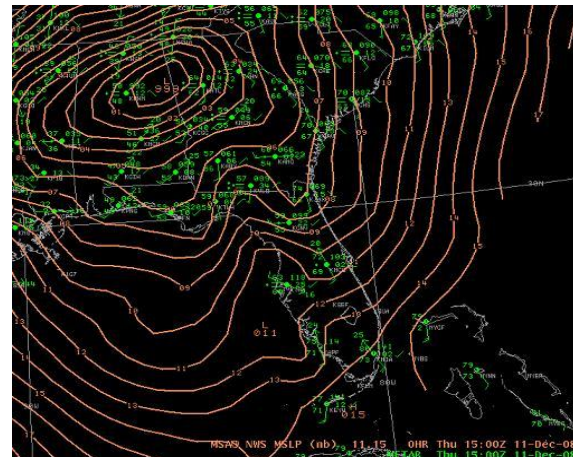
Weather Synopsis: A deep trough of low pressure dropped over the southeastern US, with the upper-level low center crossing over the northern Gulf. Low-level convergence along with divergent flow aloft allowed for a surface low to quickly deepen over the Gulf, before tracking quickly northward into Alabama, and eventually Georgia. A strong squall line developed ahead of the cold front, and was enhanced by an 850mb jet that peaked out near 50 knots. The line made fast progress across the Gulf, moving faster than 50 mph at times, before weakening over the cooler shelf waters. 40 to 50 mph winds were observed along the Sun Coast as the line came ashore, with peak winds dropping to near 25 mph inland. Most locations received between 0.5 and 2 inches of rain, with highest amounts south of Tampa Bay.



The upper-level system pictured to the left on water vapor imagery, tracked very slowly from eastern Texas to southern Mississippi through the day. A strong jet, both aloft and closer to the surface, funneled moisture off the Gulf and Caribbean into Florida. These jets also provided good ventilation for storms, especially initially. Northward movement of the surface low (pictured below) coincided with the time the line passed over the cooler shelf waters, and the movement of the strongest low-level winds north of the area.

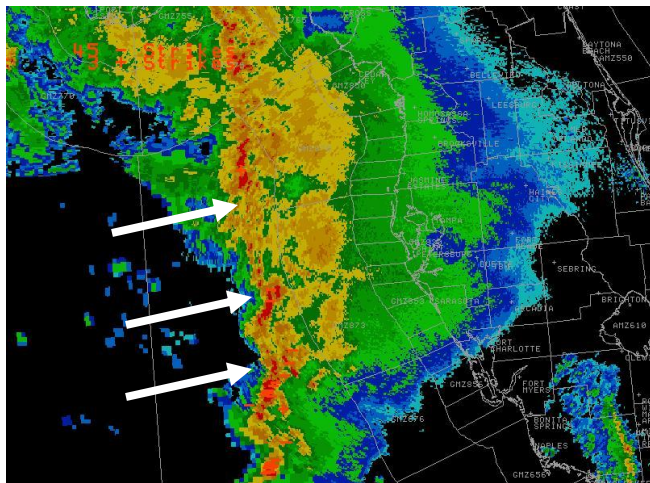


Surface observations @ 7AM
Squall Line along the coast



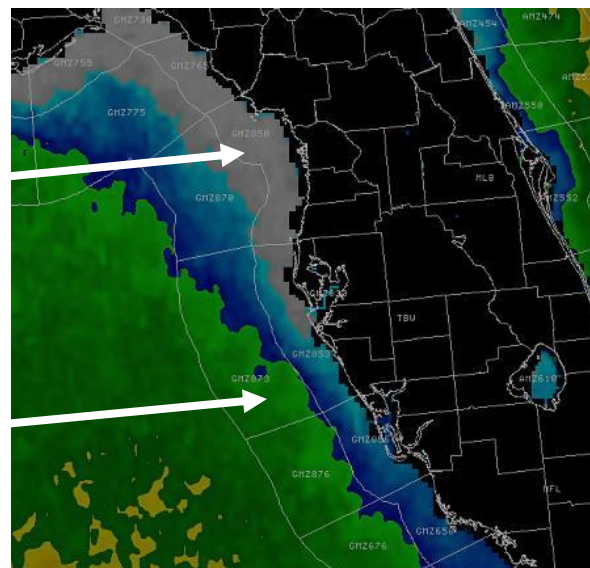
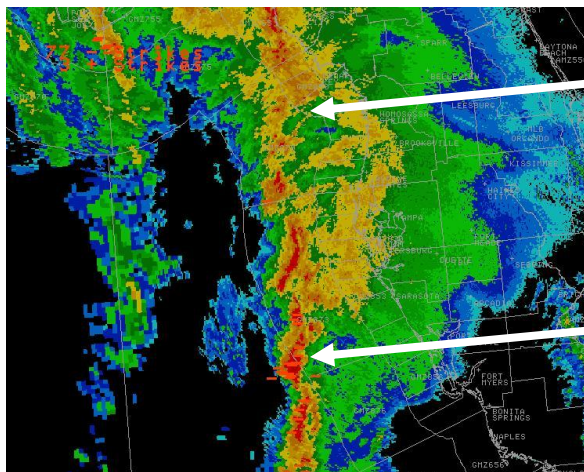
Surface observations @ 10AM
Weakened line from North Central FL to eastern Lee County

A Close Look At Radar: The squall line was quite vigorous over the eastern Gulf, with many bowing segments and strong linear appearance. Peak winds of 47 knots were measured 70 miles west of Citrus County by buoy 42036, just after the line passed. Seas peaked at 18 feet not long after the line moved through. As the squall line approached the coast and began passing over the shelf waters (where water temps were in the low 60s) the line's appearance quickly deteriorated. In this case, the loss of low level heating was too much for the mid and upper-level dynamics associated with the system to overcome. By the time the line moved ashore it had weakened substantially, and any hints of rotation noted earlier on in its life-cycle were now gone. Strong southwest flow aloft also contributed to a wealth of cloud cover and light shower activity "blowing off" from the line out ahead of the system. This cloud cover did not allow much heating to occur ahead of the line and severely limited strong to severe storm potential.

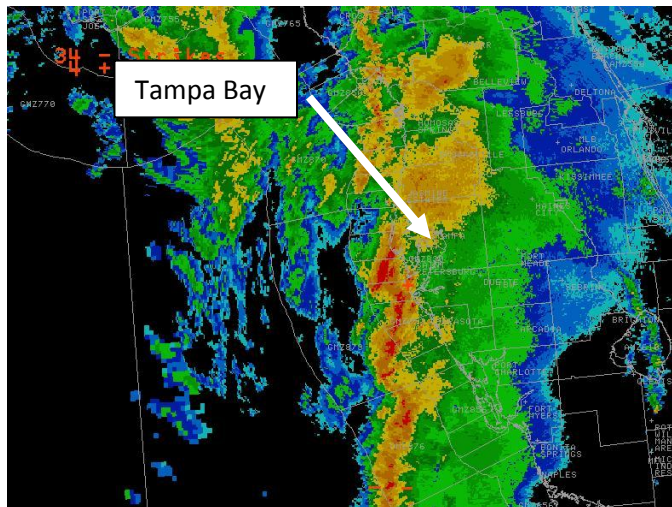


The convective line while over the warmer waters of the Loop Current. Note the strong line-echo wave pattern, bows (denoted by arrows), and strong linear nature of the line.

Also of note: The convective "blow off" clouds and precipitation can be seen already impacting western Florida.

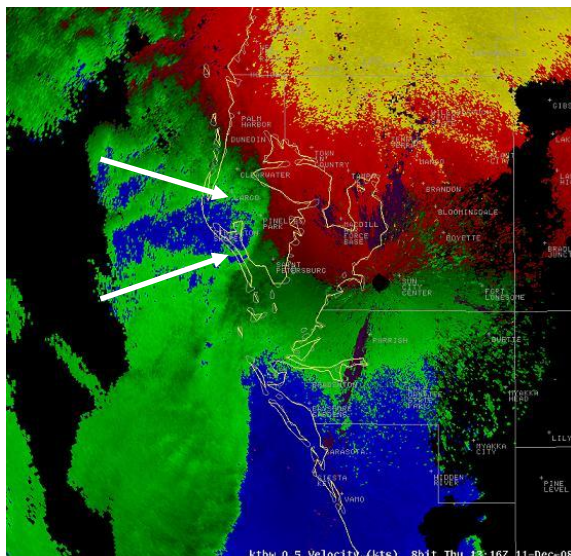


The strong influence of Gulf water temperature on storm intensity is evident in the above images. The line over the northeastern Gulf, west of Citrus/Levy Counties, has nearly stratified out, while the southern line remains strong. Water temperatures where the line weakened were near 61, while temps remained in the lower 70s further south.



By the time the line moved ashore, it was very weak north of Tampa Bay. Stronger cells remained from the Bay Southward, although a weakening trend was well underway.

The strongest cell to impact western Florida moved ashore in Pinellas County. Several reports of winds of 40 mph were recorded, and some minor damage occurred. Below is a velocity image of the wind surge moving off the Gulf just after 8AM. Velocity peaked around 45 knots very close to the surface.



Local Response/Local Storm Report Data:

This potentially hazardous event was highlighted nearly 1 week in advance and updated daily through the use of the Hazardous Weather Outlook product. The first HWO highlighting the possibility of an event was issued on Thursday, December 4th. Although the timing of the squall line was still uncertain, this event was advertised for quite some time. Coastal Flood Statements were issued for above normal tides and a high surf advisory highlighted the rough surf expected. These coastal products preceded the event by over 24 hours. A Special Weather Statement was issued to further highlight the potential for strong to severe storms, rip currents and above normal surf/tides the afternoon before the event.

During the event Special Marine Warnings and Special Weather Statements were the primary method of relaying hazardous weather potential. Special Marine Warnings followed the line from the Suwannee River to Bonita Springs, including Tampa Bay and Charlotte Harbor, until it passed inland. Special Weather Statements highlighted the potential for 40 to 50 mph winds and heavy rainfall for the line throughout its duration over coastal areas. By the time the line moved 20 miles inland Nowcasts were used as the primary highlight mechanism due to slackening winds.

Overall, the event was highlighted by 24 specialized products.

SPS-6 NOW-3 SMW-5 HWO-10